Listing of Claims:

1-103. (Cancelled)

104. (Previously Presented) A method for the production of gold metal particles, comprising the steps of:

a) generating an aerosol of droplets from a liquid wherein said liquid comprises a gold metal precursor;

b) moving said droplets in a carrier gas;

c) removing a portion of droplets from said aerosol, wherein said removed droplets have an aerodynamic diameter greater than a preselected maximum diameter; and

d) heating said droplets to remove liquid therefrom and form gold metal particles comprising at least about 50 weight percent gold metal, wherein said droplets have a size distribution such that at least about 80 weight percent of said droplets have a size of from about 1 μm to about 5 μm.

105. (Original) A method as recited in Claim 104, wherein said carrier gas is air.

106. (Original) A method as recited in Claim 104, wherein said heating step comprises passing said droplets through a heating zone having a temperature of not greater than about 1065°C.

107. (Original) A method as recited in Claim 104, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 450°C to about 750°C.

108. (Original) A method as recited in Claim 104, wherein said metal particles have a particle density of at least about 15.9 g/cm^3.

109. (Original) A method as recited in Claim 104, wherein said metal particles have a particle density of at least about 17.4 g/m^3.

110. (Original) A method as recited in Claim 104, wherein said droplets in said aerosol have a size distribution such that no greater than about 20 weight percent of the droplets in said aerosol are larger than about twice the weight average droplet size.

111. (Cancelled)

112. (Original) A method as recited in Claim 104, further comprising the step

of removing a second portion of said droplets from said aerosol, wherein said second portion of droplets have an aerodynamic diameter less than a preselected minimum diameter.

113. (Original) A method as recited in Claim 104, wherein said liquid is a solution comprising a gold metal precursor selected from the group consisting of gold nitrate, gold chloride, gold sulfate and gold oxalate.

114. (Original) A method as recited in Claim 104, wherein said liquid is a solution comprising gold chloride.

115. (Original) A method as recited in Claim 104, wherein said liquid comprises a precursor for at least one metal alloying element.

116. (Original) A method as recited in Claim 104, wherein said liquid comprises a precursor for at least one metal alloying element selected from the group consisting of palladium, silver, nickel, copper and platinum.

117. (Original) A method as recited in Claim 104, further comprising the step of coating an outer surface of said gold metal particles.

118. (Original) A method as recited in Claim 104, further comprising the step of coating an outer surface of said gold metal particles with a metal oxide coating.

119. (Original) A method as recited in Claim 104, further comprising the step of coating an outer surface of said gold metal particles with an organic coating.

120. (Original) A method as recited in Claim 104, wherein said gold metal particles further comprise a non-metallic phase.

121. (Original) A method as recited in Claim 104, wherein said gold metal particles further comprise a metal oxide phase.

122. (Original) A method for the production of composite metal particles, comprising the steps of:

a) forming a liquid solution comprising a gold metal precursor and a non-metallic second phase precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas;

d) heating said droplets to remove liquid therefrom and form metal composite particles comprising gold metal and a non-metallic second phase.

123. (Original) A method as recited in Claim 122, wherein said carrier gas comprises air.

124. (Original) A method as recited in Claim 122, wherein said heating step comprises passing said droplets through a heating zone having a temperature of less than about 1065°C.

125. (Original) A method as recited in Claim 122, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 450°C to about 750°C.

126. (Original) A method as recited in Claim 122, wherein said metal particles have a particle density of at least about 90 percent of the theoretical density for said composite particles.

127. (Original) A method as recited in Claim 122, wherein said aerosol droplets have an average size of from about 1 μm to about 5 μm and wherein not greater than about 20 weight percent of said droplets have a size greater than about twice said average droplet size.

128. (Original) A method as recited in Claim 122, further comprising the step of removing at least a first portion of droplets from said aerosol wherein said droplets in said removed first portion have an aerodynamic diameter greater than a preselected maximum diameter.

129. (Original) A method as recited in Claim 122, further comprising the step of removing a .second portion of said droplets from said aerosol, wherein said droplets in said removed second portion have an aerodynamic diameter less than a preselected minimum diameter.

130. (Original) A method as recited in Claim 122, wherein said gold metal precursor is selected from the group consisting of gold nitrate, gold hydroxide, gold chloride, gold sulfate and gold oxalate.

131. (Original) A method as recited in Claim 122, wherein said gold metal precursor is gold chloride.

132. (Original) A method as recited in Claim 122, wherein said non-metallic second phase precursor comprises a metal salt dissolved in said liquid solution.

133. (Original) A method as recited in Claim 122, wherein said non-metallic

second phase precursor comprises a colloidal suspension.

134. (Original) A method as recited in Claim 122, wherein said non-metallic second phase is a metal oxide.

135. (Original) A method as recited in Claim 122, wherein said non-metallic second phase is a metal oxide selected from the group consisting of NiO, SiO_2, Cu_2O, CuO, B_2O_3, TiO_2, ZrO_2, Bi_2O_3, PbO, SnO_2, CeO_2, Ce_2O_3, V_2O_5 and Al_2O_3.

136. (Original) A method as recited in Claim 122, wherein said composite metal particles comprise gold metal and from about 0.2 to about 35 weight percent of a non-metallic second phase.

137. (Original) A method as recited in Claim 122, further comprising the step of coating an outer surface of said composite metal particles.

138. (Original) A method for the production of metal alloy particles, comprising the steps of:

a) forming a liquid solution comprising a gold metal precursor and a second metal precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas;

d) heating said droplets to remove liquid therefrom and form metal alloy particles comprising gold metal and a second metal.

139. (Original) A method as recited in Claim 138, wherein said carrier gas comprises air.

140. (Original) A method as recited in Claim 138, wherein said heating step comprises passing said droplets through a heating zone having a temperature of less than about 1065°C.

141. (Original) A method as recited in Claim 138, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 450°C to about 750°C.

142. (Original) A method as recited in Claim 138, wherein said metal alloy particles have a particle density of at least about 90 percent of the theoretical density for said metal alloy particles.

143. (Original) A method as recited in Claim 138, wherein said aerosol

droplets have an average droplet size of from about 1 μm to about 5 μm and wherein not greater than about 20 weight percent of said droplets have a size greater than about twice said average droplet size.

144. (Original) A method as recited in Claim 138, further comprising the step of removing at least a first portion of droplets from said aerosol wherein said droplets in said removed first portion have an aerodynamic diameter greater than a preselected maximum diameter.

145. (Original) A method as recited in Claim 138, further comprising the step of removing a second portion of said droplets from said aerosol, wherein said droplets in said removed second portion have an aerodynamic diameter less than a preselected minimum diameter.

146. (Original) A method as recited in Claim 138, wherein said gold metal precursor is selected from the group consisting of gold nitrate, gold chloride, gold sulfate and gold oxalate.

147. (Original) A method as recited in Claim 138, wherein said gold metal precursor is gold chloride.

148. (Original) A method as recited in Claim 138, wherein said second metal phase is selected from the group consisting of palladium, silver, nickel, copper, tungsten, molybdenum, tin and platinum.

149. (Original) A method as recited in Claim 138, wherein said second metal phase is selected from the group consisting of palladium and platinum.

150. (Original) A method as recited in Claim 138, wherein said metal alloy particles comprise gold metal and up to about 40 weight percent of said second metal phase.

151. (Original) A method as recited in Claim 138, wherein said metal alloy particles are homogeneously alloyed with substantially no phase segregation of said gold metal and said second metal.

152. (Original) A method as recited in Claim 138, further comprising the step of coating an outer surface of said metal alloy particles.

153. (Original) A method for the production of coated metal particles, comprising the steps of:

a) forming a liquid solution comprising a gold metal precursor;

b) generating an aerosol of droplets from said liquid solution;

c) moving said droplets in a carrier gas;

d) heating said droplets to remove liquid therefrom and form metal particles comprising gold metal; and

e) coating an outer surface of said gold metal particles.

154. (Original) A method as recited in Claim 153, wherein said coating step comprises contacting said metal particles with a volatile coating precursor.

155. (Original) A method as recited in Claim 153, wherein said coating step comprises contacting said metal particles with a volatile coating precursor selected from the group consisting of metal chlorides, metal acetates and metal alkoxides.

156. (Original) A method as recited in Claim 153, wherein said carrier gas comprises hydrogen.

157. (Original) A method as recited in Claim 153, wherein said heating step comprises passing said droplets through a heating zone having a temperature of not greater than about 1065°C.

158. (Original) A method as recited in Claim 153, wherein said heating step comprises passing said droplets through a heating zone having a temperature of from about 450°C to about 750°C.

159. (Original) A method as recited in Claim 153, wherein said metal particles have a particle density of at least about 90 percent of the theoretical density for said metal particles.

160. (Original) A method as recited in Claim 153, wherein said aerosol droplets have an average size of from about 1 μm to about 5 μm and wherein not greater than about 20 weight percent of said droplets have a size greater than about twice said average droplet size.

161. (Original) A method as recited in Claim 153, further comprising the step of removing at least a first portion of droplets from said aerosol wherein said droplets in said removed first portion have an aerodynamic diameter greater than a preselected maximum diameter.

162. (Original) A method as recited in Claim 153, further comprising the step

of removing a second portion of said droplets from said aerosol, wherein said droplets in said removed second portion have an aerodynamic diameter less than a preselected minimum diameter.

163. (Original) A method as recited in Claim 153, wherein said gold metal precursor is selected from the group consisting of gold nitrate, gold chloride, gold sulfate and gold oxalate.

164. (Original) A method as recited in Claim 153, wherein said gold metal precursor is gold chloride.

165. (Original) A method as recited in Claim 153, wherein said coating is a metal oxide.

166. (Original) A method as recited in Claim 153, wherein said coating has an average thickness of not greater than about 100 nanometers.

167. (Original) A method as recited in Claim 153, wherein said coating is a metal oxide selected from the group consisting of SiO_2, Al_2O_3, ZrO_2, B_2O_5, TiO_2, Cu_2O, CuO, PbO, SnO_2,CeO_2, Ce_2O_3, V_2O_5, and Bi_2O_3.

168-175. (Cancelled)